SURAJ KUMAR

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Career Objective

As an Electrical engineer with a passion for EVs and battery technology, seeking to work on leading technology projects and add value through my technical and managerial expertise. To get an opportunity where I can make the best of my potential and contribute to the organization growth.

Academic Details

Post-Graduation Certification in Electric Vehicle Design and Development, Skill-Lync, Chennai (2022-Present)

B. Tech, Electrical Engineering, Bhubaneswar Engineering College, Bhubaneswar | **7.38 CGPA** (2014-2018)

12th , L.C. Inter College , Saharsa | **60%** (2014)

10th , High School, Bharoli, Saharsa | **69.2%** (2012)

Technical Skills

- **Modeling and Simulation :** MATLAB, Simulink, Simscape
- **Scripting :** MATLAB
- **EV:** Electric Powertrain, Control System, Battery Technology
- **CAD :** Catia V5 , E-CAD
- **Others:** MS Word , MS Excel , MS Power Point

Experience

Engineer at BNC Power Project Limited (Dec 2021 – Present)

AutoCAD Electrical | SCADA

- 400/220/132kV Substation, ACDB, DCDB, Optical Fiber Panel Troubleshooting & Maintenance Activities.
- Involved in 220V, 48V Station Battery banks and chargers panels troubleshooting & maintenance help of Schematic.
- Involved in ABB and Siemens relay troubleshooting with help of Scheme (Drawing) and CB, Isolator (3 Phase Motor).

Project Engineer at Railway Electrification (Oct 2020 – Sept 2021)

- 132/25Kv 3 No's Traction Substation and 3No's of SP, SSP Erection, Testing, Commissioning, and Cable Laying project handover on time**.**
- Involved in Testing of Ten-Delta, IR, Polarity test of 30MVA (27Kv) Power Transformer, Circuit Breaker, PT, CT, Post-Insulator and LA.
- Initial Charging of 110v DC Lead Acid Cell (55No's Cell*2V) 40AH and 200AH Battery bank fill 1180 Specific Gravity of Acid charging in Boost Mode without Power Cut 72 hours with Each Cell Voltage.

Hardware Engineer at SHARPCON LLP (Aug 2019 – June 2020)

Eagle | LT spice

- Design power electronics gadgets like DC-DC, AC-DC Power supply circuits**..**
- Buck converter.
- Arduino Nano configuration.
- Arduino Nano configuration.
- IR Sensor Using Servo Motor Sanitizer.

Test Engineer at Power Grid Corporation of India Limited (Aug 2018 – Aug 2019)

AutoCAD Electrical | SCADA

- Troubleshooting of Relays (DC Supervision Relay, DC Earth Fault , DC C/O relay, Mho, Differential Protection, Restricted Earth Fault, and more relays). Designed the steering geometry and powertrain of the vehicle.
- Involved in Station Battery Bank (220v,48v DC) of regular verification like Per Cell Voltage, total Cell Voltage, Cooling System and Battery Charger healthiness of charger if need Float or Boost Charging and Ground Earth Fault activities. Involved in SF6 Gas Insulated Switchgear Maintenance activities. Improved dynamics of the vehicle using non-conventional steering geometry.
- ACDB, DCDB, Optical Fiber Panel Troubleshooting & Maintenance Activities.

Projects

Modelling and Simulation of an Electric Vehicle **MATLAB | Simulink**

- Created a model of an electric vehicle which runs on a BLDC Motor and a battery using Powertrain Blockset.
- Used pulse width modulation to power the BLDC motor using the battery.
- Implemented regenerative braking system and tracked the SOC of the battery.
- Simulated the model using different drive cycles as reference and used Magic formula for tire modeling.

Control System for an Electric Vehicle **MATLAB | Simulink**

- Implemented a PID controller for longitudinal control of an electric vehicle.
- Studied the response of the controller to the system and modified the gain values for minimum error.
- Controlled the powertrain input and the brake input using a single PID controller.

Created A Detailed Matlab Model of An Electric Rickshaw (Three-Wheel Passenger Vehicle): **MATLAB | Simulink**

- The major blocks used to design the Electric rickshaw using Simulink are drive cycle, driver, controlled PWM voltage, H-bridge, battery source, dc motor.
- MATLAB model of an electric rickshaw (three-wheel passenger vehicle) with Rear wheels driven by PM brushed type motor.

MATLAB/Simulink Project: Design Of Electric Vehicle **Simulink | MATLAB**

- A DC motor drive along with PWM controller is designed using Simulink blocks.
- Rear wheel drive is setup using Vehicle block set and FTP75 drive cycle is used for analysis.
- State of charge, velocity plot and distance calculator has been analyzed.

Modelling An Electric Car With Li-Ion Battery **MATLAB | Simulink**

- The major blocks used to design the EV vehicle using Simulink are drive cycle, driver, controlled PWM voltage, H-bridge, battery source, dc motor.
- Advantages of EV - In order to address the issue of rising pollution, global warming, depleting natural resources, etc.

Modelling of A Battery Pack **MATLAB | Simulink**

- The battery pack was made to design as 33S358P divided into sub battery packs which is combination of 18S51P series with 15S51P, this combination is parallel with 7 copies as shown above total results in 33S417P with capacity of 150Kw with 120V.
- To charge and discharge the Total battery pack Master and Slave BMS topology is used which is efficient in all ways like cost, design, control and installation Pack

Design a Battery Pack for a Car Roughly 150 KW with 120 V. Use 3500 mah 3.6V Nominal NMC Chemistry Cell. **MATLAB | Simulink**

- Design a battery pack for a car roughly 150kW
- Design the battery pack configuration.
- Draw the BMS topology for this battery pack.

Route the Wiring harness on given car body and Prepare flatten view drawing in CATIA V5. **Catia V5**

- Application of all Packaging rules, Industry best practices studied in this course shall be demonstrated in design. Apply Protection coverings as required.
- For the below mentioned parts,

Create the catalogue for each type and Define the parts accordingly.

- With the help of Metal plate, place the parts which you have defined and route them.

Publications

Home Automation using IOT and BLE Technology

- Published in Danik Jagran newspaper in Bihar. June 2017

Drone for Agriculture and Police Department (6 Member)

- Invite by Odisha Govt Skill up Odisha and got gift from CM of Odisha Honorable Shree Naveen Patnaik.

Trainings and Workshops

Industrial Automation (Dec 17 – Dec 17) - **CTTC, Bhubaneswar**

- Programmable Logic Controller
- Pneumatic Control
- Basic SCADA

Vocational Training (Jul 17 – Aug 17) - **NTPC, Kahalgaon**

- Basic SCADA.
- 2840 MW Capacity (210*4MW and 500*3MW) 7 Unit.

Power System Protection (May 22) - **Udemy**

- Basic of Battery
- Cooling Sytem
- Series- Parallel Cell
- Architecture Slave role
- Force analysis of race cars and off-road vehicles

Mathworks Virtual Training (March 22) **- Mathworks**

- Modeling of physical systems in Simulink and Simscape.
- Implementing control logic using Stateflow.

- EV/HEV Simulations using MATLAB and Simulink.
- Introduction to modelling using Simscape 3D.

Awards and Certificates

- Introduction to Control of electric Vehicle using MATLAB (Skill Lync) 2022
- Introduction to HEV using MATLAB and Simulink (Skill Lync) 2023
- Basics about Li-ion Battery & Modelling (Skill Lync) 2023
- Wiring Harness Design using CATIA V5 (Skill Lync) 2023
- Simulation and Design of Power Converters For EV using MATALB and Simulink

Extracurricular Activities and Achievements

- Volunteer For Robotics Game from Entrepreneurship Awareness Camp by IIT Delhi.
- Participated in inter-College Badminton game competitions.
- Participated in Photography competitions.